event is deplorable since in the "long run" all things will work together for good. The fact that there must be a cause for everything is used as evidence to show that everything is therefore as it should be. As a matter of fact the economic salvation of the world is being worked out before our eyes. Wealth was never so plentiful or so evenly distributed as now; wages never so high, capitalists never so well off; inventions for saving labor are more numerous and useful than ever before; the altruistic spirit is rapidly spreading; those who fail or die do so because they deserve such death or failure. In a sort of statistical "lean-to" the author combats the statements made in Professor Spahr's *Distribution of Wealth in the United States.* Those who follow the subtleties of Professor Spahr and Mr. Willey will obtain an excellent view of some aspects of the statistical method.

PARKER WILLIS.

Researches into the Mathematical Principles of the Theory of Wealth. By AUGUSTIN COURNOT, 1838. Translated by NATHANIEL T. BACON, with a Bibliography of Mathematical Economics by IRVING FISHER. (*Economic Classics.*) New York: The Macmillan Company, 1897. 12mo. pp. ix+209; one plate.

COURNOT'S original work has been out of print for a long time and has been practically inaccessible to most economists. The translation of it is timely because of the interest shown at the present time in the application of mathematics to political economy.

Cournot was one of the first economists who met with success in the attempt of establishing and elaborating a thoroughly consistent theory of value by an analysis of consumption. He may be called the principal founder of the mathematical school of political economy, for this work was published sixteen years before the first publication of Gossen. As such his work is deserving of careful study. But the book is of itself worthy of study. The larger part of its conclusions have not been superseded, and its reasoning is still fresh and invigorating. At the time of its publication it was not well received by the public and was forgotten until rediscovered by Jevons.

Cournot uses as synonymous terms *wealth* and *value in exchange.* He disregards utility, because utilities are questions of valuation that are not soluble by calculation nor by logical argument.

In chapter ii, which treats "Of Changes in Value, Absolute and

Relative," his definition of value is best stated in Article 10: "There are only relative values; to seek for others is to fall into contradiction with the very idea of *value in exchange*, which necessarily implies the idea of a ratio between two terms. But also an accomplished change in this ratio is a relative effect, which can and should be explained by absolute changes in the terms of the ratio. There are no absolute values, but there are movements of absolute rise and fall in values." In continuing the discussion Cournot considers that the money metals under ordinary conditions and for short periods are nearly free from variations in value, and here, as in astronomy, it is necessary to note that *secular* variations are independent of *periodic* variations. He believes that the causes which produce absolute variations in the value of the monetary standards should be investigated; and then the variation of the values of other articles should be reduced to the corrected value of money. "This *corrected money* would be equivalent to the mean sun of the astronomers." One is surprised at Cournot's anticipation of modern thought upon this subject and is impressed with the idea that his discussion is worthy of more serious consideration than the treatment of the same subject by contemporaneous writers.

In the third chapter the discussion of foreign exchange is based upon the hypothesis of a recurring annual indebtedness between nations. The fact is deduced that the problem is always determinate. It fails to entirely explain the complex facts of the exchange market because the hypothesis only takes into account static causes, employing the idea of economic equilibrium; but it is a correct first approximation, and no more complete theory has been formulated up to the present time. At the close of this chapter, Cournot forsakes his chain of rigid reasoning and substitutes opinions for which he would have found it very difficult to have furnished proof.

In chapter iv the theory of prices begins with the hypothesis that "each one seeks to derive the greatest possible value from his goods or his labor." Cournot assumes that the demand for an article is a particular function of its price, and if we know the form of this function, we would know the law of demand; and the form of the function depends upon the utility of the article. The function is considered as continuous and as a result of this utility, so long as the variations in price are but a small part of the original price, the variations in demand will be proportional to the variations in price. The general

course of demand and its relation to the price of a commodity is shown by the general demand curve which Cournot was the first to introduce.

In the chapter which treats of monopoly the deductions of the quantitative relations between price and the quantity demanded at that price have an analogy in the subjective fact, treated by Cournot, "that the value in exchange is the differential coefficient of its value in use." In the case of a monopoly the fixed costs do not affect price. This principle has now been worked out in railroad rates and monopoly charges. An increase in the cost of production of a monopoly product increases the price sometimes more and sometimes less than the increase of cost; and there is no equality between the reduction of cost and the fall in price of a commodity.

The formulæ which have been developed by the author to take account of cost were well adapted to the investigation of the effect of a tax, which he regarded as an increase of the cost of production. The discussion applies to a variety of taxes, and also to bounties. It supposes the existence of a monopoly or of perfect competition. Among the important theorems discussed are: That a commodity will be sold at a higher price to consumers in proportion as the tax is prematurely collected; and that consumption will be reduced by a tax levied at an early stage. It is important, therefore, to consumers, to producers, and the state, that the tax be paid as late as possible. It had best he paid by the consumer, if the increased cost of collection and the tendency to complain of the exactions of the tax do not forbid it. If a tax of so much per unit is imposed upon a monopolized article there is a rise in price, greater, equal to, or less than the tax. The loss, both to the consumer and to the monopolist, will be greater than the gross profit of the treasury. Hence the author says that

> The loss borne by the consumers will therefore remain without any compensation and that there is no doubt that the doctrine of Quesnay's school is perfectly applicable to the products of monopoly; namely, that it is better to levy a direct tax on the net income of the monopolist than to levy a specific tax on the commodity.

In case of a bounty granted to a producer under a monopoly, the gain resulting from the premium to the producer is in the nature of the case less than the sacrifice to the public at whose cost the gain is secured. That the levying of an ad valorem tax causes a loss to consumers greater than the gross profit of the treasury, just as in other kinds of taxation.

The treatment of "competition of producers" as found in chapter vii, is open to some very serious objections; for Cournot (in this as in the third chapter) has treated the static conditions of the subject instead of the dynamic ones; as a result, the simpler examples chosen do not meet the more complex conditions of the mercantile world. The effect of competition is shown to be a reduction of price. For the same total production, the costs will always be greater for competing producers than they would be under a monopoly; because the competitor producing at the least advantage will not stop production so long as he can secure any profit, while those controlling the monopoly will only operate the plants where the costs are lowest.

In chapter vii, on unlimited competition, Cournot, although he does not state it in words, very clearly, brings out the principle that the cost of production of the last unit produced fixes the price—"marginal cost of production." In a subsequent article he shows that when the cost of a commodity is increased, "in all cases the rise in price will be less than the increase in cost." It must be remembred that "cost," as interpreted by Cournot, means expense, exclusive of the pay of the entrepreneur for his own labor. In this chapter is also formulated the "law of diminishing returns."

In the development of the use of curves, he begins and ends with the collective supply curve, instead of deriving it from the individual supply curves like most of the recent writers. He clearly shows, what is now generally known, that the intersection of this general supply curve with the general demand curve determines price.

The chapter on the communication of the markets attempts to disprove some of the erroneous opinions on the effects of duties and bounties. By a mathematical error on page 122 it is apparently shown that a duty lowers the price in the exporting market. The error in the equation is pointed out by the translator, and the author's conclusions are to be modified accordingly.

The chapters on "Social Income" are quite unsatisfactory. They are much less valuable than any of the preceding due largely to the lack of clear definitions and an inadequate method of treatment.

The reader whose knowledge of the principles of differential calculus is fresh will find no trouble in following the mathematical reasoning of the author; but the general course of reasoning and the final conclusions can be readily grasped by the reader unaquainted with mathematics.

The work of the translator has been well done. The value of the book is very much increased by the addition of a complete bibliography of works on economics in which mathematical reasoning is employed.

F. D. MERRITT.

Aristocracy and Evolution: A Study of the Rights, the Origin, and the Social Functions of the Wealthier Classes. By W. H. MALLOCK. New York: The Macmillan Company, 1898. 8vo, pp. xxxiii + 385.

ON a cursory acquaintance with this volume one is tempted to dismiss it with the comment that Mr. Mallock has written another of his foolish books. The objective point of the new book is still the enforcement of the author's pet fallacy, which he has expounded so felicitously on many a former occasion. It is restated here with somewhat greater circumstance than before, and is backed by much telling illustration and some substantial information that might well have served a more useful purpose. A fuller acquaintance with its contents, however, will convince the reader that the book has substantial merits, although these merits do not belong with the economic side of the argument.

While the present volume covers a wider range of phenomena and traces the working of the great man's dominating efficiency through a greater variety of human relations than Mr. Mallock's earlier books have done, the chief point of the argument is still the productive efficiency of the great man in industry and the bearing of this productive efficiency upon the equitable claim of the wealthy classes to a superior share of the product. What is to be proven is the equity and the expediency of a system of distribution in which a relatively large share of the product of industry goes to the owners of capital and the directors of business. For this purpose "the great man" in industry is tacitly identified with the captain of industry or the owner of capital. It is right that the great man, so understood, should receive a large share, because he produces a large proportion of the product of industry (book iii; pp. 197–267). And it is expedient that exceptional gains should come to this exceptional wealth-producer, because on no other terms can he be induced to take care of the economic welfare of the community — and, in the nature of things,